DETAILED ACTION

Election/Restrictions

Applicant's election of new claims in the reply filed on 09/18/2009 is acknowledged.

Specification

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.
(b) CROSS-REFERENCE TO RELATED APPLICATIONS.
(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
(d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
(e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
(f) BACKGROUND OF THE INVENTION.
    (1) Field of the Invention.
    (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
(g) BRIEF SUMMARY OF THE INVENTION.
(h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
(i) DETAILED DESCRIPTION OF THE INVENTION.
(j) CLAIM OR CLAIMS (commencing on a separate sheet).
(k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
(l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 39 – 45 are rejected under 35 U.S.C. 102(b) as being anticipated by Takemoto (US 5,105,278 A).

Regarding claim 39, Takemoto discloses a camera (Figure 3 Camera) comprising:

an image sensor (Figure 1 Image pick Section 1 Comprises a charge coupled device) arranged to generate an image signal (Col 4 Lines 7 - 10, " he image pickup section 1 has a solid-state image sensor such as a charge coupled device (CCD) for converting the image of a photographed object formed through a lens to an electric signal and outputting this electric signal to the preamplifier 2");

a lens arrangement (Figure 1 Image pick Section 1 comprises lens) which focuses an image onto the image sensor (Col 4 Lines 7 - 10, " he image pickup section 1 has a solid-state image sensor such as a charge coupled device (CCD) for converting the image of a photographed object formed through **a lens** to an electric signal and outputting this electric signal to the preamplifier 2), the focus being variable in accordance with a control signal applied thereto (Col 4 Lines 61 – 68 "The focus detecting section 6 transmits a control signal to the lens moving section 7 so as to move the lens to a position in which the magnitude of the specified high frequency component is maximum. The lens moving section 7 receives this control signal and moves the lens

and then stops the movement of the lens in the position in which the magnitude of the specified high frequency component is maximum");

an encoder (Figure 3 Encoding Section 5) arranged to encode the image signal from the image sensor into an encoded signal compressed form (Col 4 Lines 26 – 31 "The encoding section 5 divides image data stored to the frame memory 4 into a plurality of data blocks each composed of n x n picture elements. The encoding section 5 performs a discrete cosine transformation (DCT) every data block to decompose the image data into the respective frequency components");

a control circuit (The automatic focusing apparatus including a focus detecting section 6, The automatic focusing apparatus or the electronic camera is controlled by some controller or each component has its own controller and the combination of all the controllers is the control circuit of the applicant inventions) arranged to control the focus of the lens arrangement by applying said control signal to the lens arrangement (Col 4 Lines 61 – 68 "The focus detecting section 6 transmits a control signal to the lens moving section 7 so as to move the lens to a position in which the magnitude of the specified high frequency component is maximum. The lens moving section 7 receives this control signal and moves the lens and then stops the movement of the lens in the position in which the magnitude of the specified high frequency component is maximum"),

Wherein the control circuit (The automatic focusing apparatus including a focus detecting section 6) is capable of controlling the encoder (Figure 1 Encoding Section) to operate in two modes (Page 4 Lines 16 – 23, "he encoding section 5 orthogonally

converts and decomposes the digital signal stored to this frame memory 4 to respective **frequency components in a frequency region**), wherein in the first mode the encoded signal preserves low spatial frequency components of the image signal preferentially (Col Lines 38 – 40 "a leftmost and uppermost transformation coefficient shows the magnitude of a direct current component provided from the image") and in the second mode the encoded signal preserves high spatial frequency components of the image signal preferentially (Col 40 – 47 "A transformation coefficient lower than this leftmost and uppermost transformation coefficient shows the magnitude of a high frequency component of a longitudinal wave. A transformation coefficient on the right-hand side of the leftmost and uppermost transformation coefficient shows the magnitude of a high frequency component of a transversal wave"), and

the control circuit (The automatic focusing apparatus including a focus detecting section 6) is operative to control the focus of the image by:

controlling the encoder to operate in said second mode [Col 4 Lines 16 – 25 the encode operates in both low frequency and **high frequency mode (second mode)**];

determining the amount of data in the encoded signal as a measure of the quality of the focus of the image on the image sensor (Col 4 Lines 58 – 61);

controlling the focus of the lens arrangement on the basis of the determined amount of data (Col 4 Lines 61 – 68 "The focus detecting section 6 transmits a control signal to the lens moving section 7 so as to move the lens to a position in which the magnitude of the specified high frequency component is maximum. The lens moving section 7 receives this control signal and moves the lens and then stops the movement

of the lens in the position in which the magnitude of the specified high frequency component is maximum"); and

subsequently controlling the encoder to operate in said first mode (Col 4 Lines 16 – 25 the encode operates in both **low frequency (first mode)** and high frequency mode".

Regarding claim 40, Takemoto further discloses a camera (Figure 3, Camera) according to claim 39, wherein the encoder comprises a JPEG encoder (Col 4 Lines 53 – 55, Transformation coefficient F_{ij} are quantized and Huffman encoded to compress data of the image) comprising:

a discrete cosine transformation block (DCT) arranged to transform the image signal into spatial frequency components (Col 4 Lines 29 – 32 "The encoding section 5 performs a discrete cosine transformation (DCT) every data block to decompose the image data into the respective frequency components");

a quantisation block arranged to quantise the spatial frequency components output from the discrete cosine transformation block in accordance with a matrix of quantization levels each in respect of a respective spatial frequency component (Col 4 Lines 53 – 55, Transformation coefficient F_{ij} are **quantized** and hafmann encoded to compress data of the image); and

an encoder block arranged to encode the quantized image signal in the frequency domain output from the quantization block, and the control circuit is capable of controlling the encoder to operate in said two modes by causing the quantization block to use different respective matrices of quantization levels (Col 4 Lines 53 – 55,

Transformation coefficient F_{ij} are quantized and **hafmann encoded** to compress data of the image).

Regarding claim 43, a camera according to claim 39, wherein said variable focus lens arrangement comprises an actuator arranged to drive movement of the lens arrangement in accordance with the control signal applied thereto to vary the focus of the image on the image sensor (Col 4 Lines 61 – 68 "The focus detecting section 6 transmits a control signal to the lens moving section 7 so as to move the lens to a position in which the magnitude of the specified high frequency component is maximum. The lens moving section 7 receives this control signal and moves the lens and then stops the movement of the lens in the position in which the magnitude of the specified high frequency component is maximum").

Regarding claim 45, a camera according to claim 39, wherein said controlling of the focus of the lens arrangement on the basis of the determined amount of data comprises controlling the focus of the lens arrangement to minimize the determined amount of data (Col 4 Lines 61 – 68 "The focus detecting section 6 transmits a control signal to the lens moving section 7 so as to move the lens to a position in which the magnitude of the specified high frequency component is maximum. The lens moving section 7 receives this control signal and moves the lens and then stops the movement of the lens in the position in which the magnitude of the specified high frequency component is maximum").

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takemoto (US 5,105,278 A).

Regarding claim 41, Takemoto further discloses a camera according to claim 39, wherein in the second mode the control circuit controlling the quantization block.

Takemoto does not clearly disclose the control circuit causing the quantization block to use a matrix of quantization levels which is the reciprocal of a matrix of spatial frequency coefficients of a high-pass filter.

KSR is used here. It would have been obvious to try to use an inverse or the reciprocal of a matrix of spatial frequency coefficients of a high-pass filter.

Therefore it would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the quantization matrix of Takemoto with a reciprocal of a matrix of spatial frequency coefficients of a high-pass filter. The motivation to do so is to decrease the calculating time within the JPEG encoder.

Regarding claim 42, Takemoto a camera according to claim 41, wherein said high-pass filter is used,

Takemoto does not disclose the high pass filter is the Laplacian of a Gaussian filter. Official notice hereby is taken. It is well known in the art to use a Gaussian filter instead of a high pass filter. Therefore it would have been obvious to one skilled in the

art at the time the invention was made to change the high pass filter of Takemoto with a Laplacian of a Gaussian filter. The advantage of using Laplacian of a Gaussian filter is for approximating a Gaussian smoothing filter in order to reduce its sensitivity to noise.

Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takemoto (US 5,105,278 A) in view of Kenno et al. (US 6,010,537).

Regarding claim 44, Takemoto disclose a camera according to claim 43, Takemoto does not disclose wherein the actuator is a piezoelectric actuator.

Konno in FIG. 22 discloses a block diagram showing the control structure for moving the image blur compensating lens unit in the zoom lens system of the first embodiment. An image blur detecting sensor 101 is either incorporated in the lens unit or provided separately therefrom so as to detect the magnitude and direction of an image blur. The detection results are fed to a CPU 100, which in response outputs to a driver 102 a control signal indicating the distance and direction through and in which a driving actuator 103 is to be driven. The driver 102, in accordance with the control signal fed from the CPU 100, generates driving pulses for driving the driving actuator 103. The driving actuator 103, in accordance with the driving pulses, moves the image blur compensating lens unit through the specified distance in the specified direction that is perpendicular to the optical axis so as to achieve image blur compensation. Note that a common stepping motor or a piezoelectric actuator using a PZT device may be used as the driving actuator 103. Furthermore, when the zoom lens system of the first embodiment is applied, for example, to an interchangeable lens for a single-lens reflex

camera, the CPU 100 and the image blur detecting sensor 101 may be provided either in the lens or in the camera body.

Therefore it would have been obvious to one ordinary skilled in the art at the time the invention was made to change the lens moving section of Takemoto to a piezoelectric actuator as taught by Konno. The advantage of using a piezoelectric actuator is for making the camera compact and it provides linear displacement thereby making it suitable for positioning the lens of a camera.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SELAM GEBRIEL whose telephone number is (571)270-1652. The examiner can normally be reached on Monday - Friday 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571)272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SELAM GEBRIEL/
Examiner, Art Unit 2622

Wednesday, October 14, 2009

/TUAN HO/

Primary Examiner, Art Unit 2622